

Claims

1. A semiconductor device comprising a substrate of a first semiconductor material and a compound layer of said first semiconductor material and a second semiconductor material disposed on the substrate, the ratio of the first material to the second material of the compound layer being decreased away from the substrate towards the upper surface of the compound layer, wherein the rate of decrease of the ratio varies within said layer.
- 10 2. A semiconductor device as claimed in claim 1, in which the rate of decrease of the ratio increases away from the substrate towards the surface of the compound layer.
3. A semiconductor device as claimed in claims 1 or 2, in which the rate of decrease of the ratio varies linearly on 15 opposite sides of an intermediate point disposed within said layer at which the rate varies.
4. A semiconductor device as claimed in claims 1 or 2, in which the rate of decrease of the ratio varies non-linearly within said layer.
- 20 5. A semiconductor device as claimed in claims 1 or 2, in which the ratio remains constant between points disposed intermediate said layer.
6. A semiconductor device as claimed in claims 1 or 2, in which the ratio increases between points disposed intermediate 25 said layer.
7. A semiconductor device as claimed in any preceding claim, in which a final layer comprising said first material is deposited on the surface of the compound layer.
8. A semiconductor device as claimed in any preceding

claim, in which the first material is silicon.

9. A semiconductor device as claimed in any preceding claim, in which the second material is germanium.

10. A semiconductor device as claimed in any preceding 5 claim, in which the composition of the compound layer at the upper surface thereof comprises 10-50% of said second material.

11. A semiconductor device as claimed in claim 10, in which the composition of the compound layer at the upper surface thereof comprises substantially 20% of said second material.

10 12. A semiconductor device substantially as herein described with reference to Figures 3 or 4 of the accompanying drawings.

13. A method of manufacturing a semiconductor device, the method comprising providing a substrate of a first 15 semiconductor material depositing a compound layer of said first semiconductor material and a second semiconductor material on the substrate such that the ratio of the first material to the second material of the compound layer decreases away from the substrate towards the upper surface of the 20 compound layer, the rate of decrease of the ratio being varied within the layer.

14. A method as claimed in claim 13, in which the rate of decrease of the ratio is increased away from the substrate towards the surface of the compound layer.

25 15. A method as claimed in claims 13 or 14, in which the rate of decrease of the ratio is varied linearly on opposite sides of an intermediate point disposed within said layer where the rate is varied.

16. A method as claimed in claims 13 or 14, in which the

rate of decrease of the ratio is varied non-linearly within the layer.

17. A method as claimed in any of claims 13 to 16, in which the ratio of the first material to the second material of the 5 compound layer is decreased in part by decreasing the temperature at which the layer is deposited from the substrate towards the surface of the compound layer.

18. A method of manufacturing a semiconductor device, the method being substantially as herein described with reference 10 to Figures 3 or 4 of the accompanying drawings.